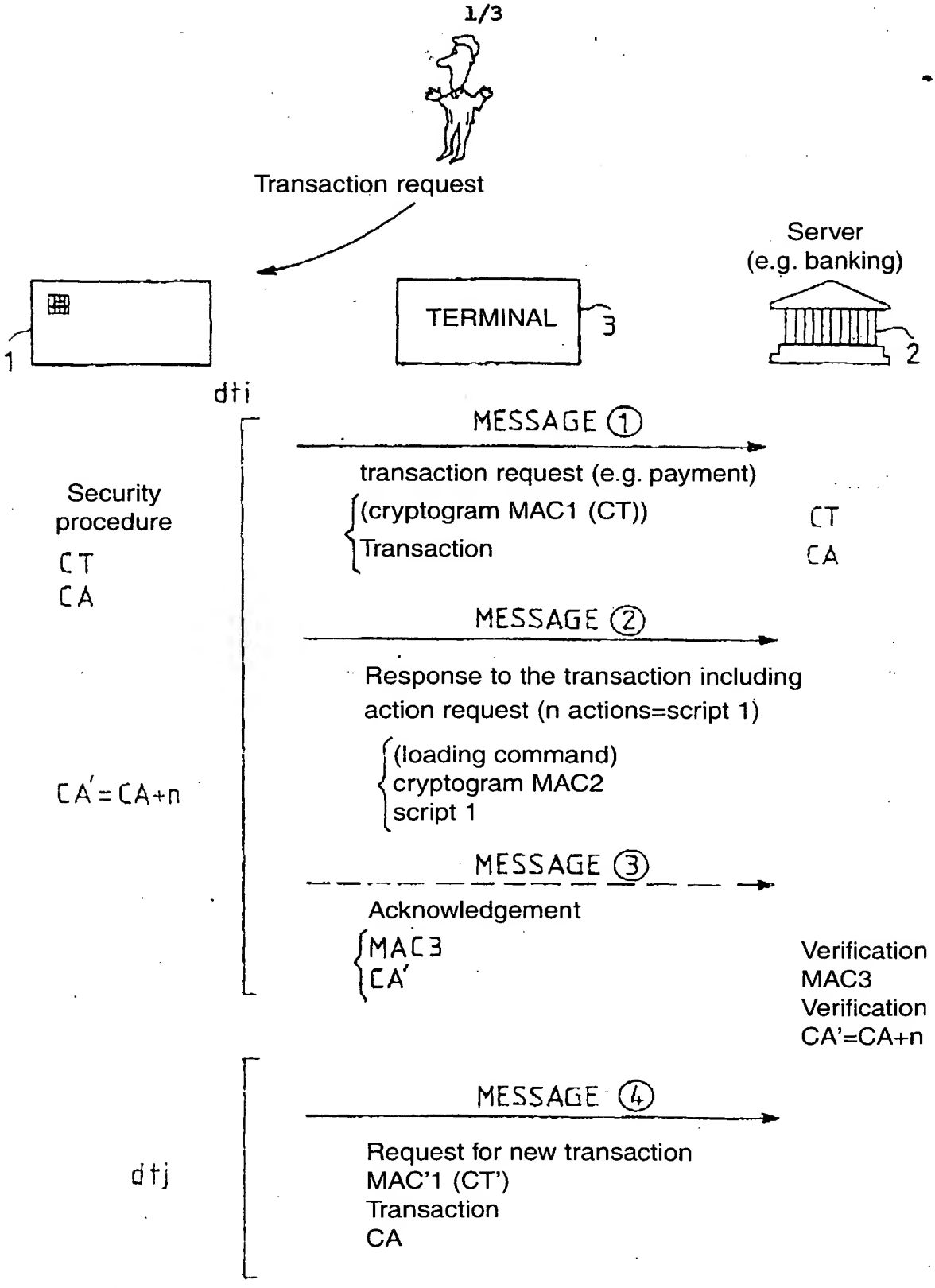
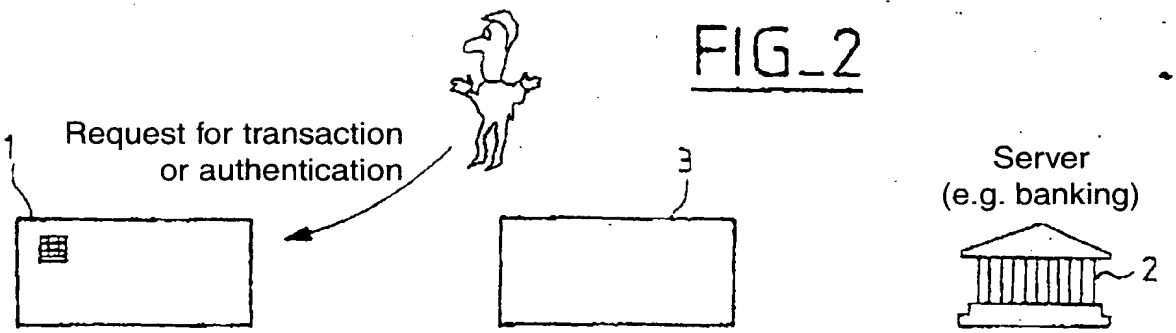

Transaction request
Server
(e.g. banking)
TERMINAL
3
1
2
dti
MESSAGE ①
transaction request (e.g. payment)
(cryptogram MAC1 (CT))
Transaction
CT
CA
Security
procedure
CT
CA
MESSAGE ②
Response to the transaction including
action request (n actions=script 1)
(loading command)
cryptogram MAC2
script 1
CA'=CA+n
MESSAGE ③
Acknowledgement
MAC3
CA'
Verification
MAC3
Verification
CA'=CA+n
MESSAGE ④
Request for new transaction
MAC'1 (CT')
Transaction
CA
dtj

FIG_1

FIG_2



Application
- Calculation of card authentication data MAC1.
Reading of action counter CA

MESSAGE ①

Transaction request
- MAC1
- CA
- Banking transaction

- Verification MAC1
- Performs the transaction
- Calculation of server authentication data MAC2
- Preparation of command for changing parameter of script 1
- Storage of CA and script 1 in DB server

E.g. line cut off

MESSAGE ②

Response to transaction including action request (script 1)

{loading command
MAC2, script 1)

MESSAGE ③

Application
- Calculation of card authentication data MAC1
- Reading of action counter CA

New transaction request

{- MAC1, CA
- Banking transaction

- Verification of MAC1
- Verification of CA_{card} = CA_{server} ⇨ cancels last transaction
- Calculation of MAC2
- Preparation of new script 2
Storage CA' and script 2 in DB server

MESSAGE ④

Response to transaction including action request (script 2)

{Loading command
MAC 2, script 2

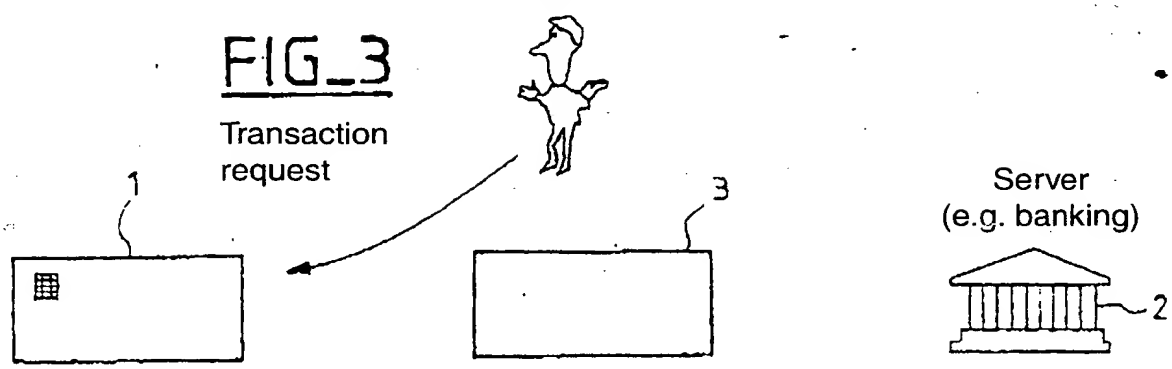
- Verification of MC2
- If MAC2 OK then effect script 2#
- If script 1 OK, incrementation CA=CA+1
- Calculation of acknowledgement MAC3

MESSAGE ⑤

Acknowledgement
MAC 3, CA+1

- Verification MAC 3
- Verification CA'=CA+1
- Erasure of DB

FIG_3



Application
- Calculation of card authentication data MAC1.
- Reader for action counter CA

MESSAGE (1)

Transaction request
- MAC1
- CA
- Banking transaction

- Verification of MAC1
- Effects transaction
- Calculation of server authentication data MAC2
- Preparation of change in parameter command script 1
- Storage of CA and script in DB server

MESSAGE (2)

Response to transaction including action request (script 1)
{ Loading command
MAC2, script 1

- Verification of MAC2
- if MAC 2 OK then effect script 1
- if script 1 OK incrementation CA'=CA+1
- Calculation of acknowledgement MAC3

MESSAGE (3) (e.g. line cutoff)

Acknowledgement

MESSAGE (4)

Application
- Calculation of card authentication data MAC1
- Reading of action counter CA'=CA+n

New action request
- MAC1, CA'
- Banking transaction

- Verification of MAC1
- Verification
- CA' $_{card}$=CA+n last transaction OK
- Effects current transaction
- Calculation MAC2
- Preparation new script 2
- Storage CA' in script 2 in DB server

MESSAGE (5)

Response to transaction including action request (script 2)
{ Loading command
MAC2, script 2

- Verification MC2
- if MAC2 OK then effects script 2
- if script 1 OK, incrementation CA'=CA'+1
- Calculation of acknowledgement MAC3

MESSAGE (6)

Acknowledgement
MAC3, CA'

- Verification MAC3
- Verification of CA'=CA'+1
- Erasure of DB